

**REMARKS**

Claims 1, 4 and 6 through 33 were pending in the application. New Claim 34 has been added.

Claims 1 and 27 have been amended to reflect advantageous inventive food casings in which the coating fills the interstices within the reinforcement, as well as to address grammatical informalities. Support for this amendment can be found in the Application-as-filed, for example on Page 8, lines 14 through 16.

Claim 25 has been amended to remove the recitation relating to further natural and/or synthetic polymers within the protein coating. Support for this amendment can be found in the Application-as-filed,

Claim 25 has also been amended to reflect advantageous inventive food casings in which the coating permeates the fibrous material and fills interstices therein. Support for this amendment can be found in the Application-as-filed, for example in Claim 1 and on Page 8, lines 14 through 16.

Claim 25 has additionally been amended to reflect expedient embodiments in which the casing incorporates a single coating. Support for this amendment can be found in the Application-as-filed, for example on Page 3, line 31 through Page 4, line 1.

Claim 31 has been amended to reflect beneficial casings consisting of reinforcement and coating. Support for this amendment can be found in the Application-as-filed.

Claim 31 has further been amended to reflect expedient embodiments in which the dried casing has a weight per unit area of 30 to 200 g/m<sup>2</sup>, in lieu of the recited coating weight. Support for this amendment can be found in the Application-as-filed, for example on Page 10, lines 12 through 14.

Claim 32 has been canceled solely to advance prosecution of the above-referenced case.

Claim 34 has been added to complete the record for examination and highlight advantageous embodiments of the invention.

Claim 34 is directed to expedient embodiments in which the inventive casings consist essentially of a fibrous reinforcement and a protein-containing coating permeating the reinforcement and filling interstices therein. Support for Claim 34 can be found in the Application-as-filed.

Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

Section 112 Rejection

Claim 31 stands rejected over the recited coating weights. Claim 31 has been amended to recite coated casing weights in lieu of coating weights. As noted above, support for this amendment can be found in the Application-as-filed. Accordingly, Applicants respectfully request withdrawal of the foregoing rejection.

Claim 32 stands rejected over the recitation "inedible." Without addressing the merits of the rejection, Claim 32 has been cancelled, thereby obviating the outstanding rejection.

*The Claimed Invention is Patentable  
in Light of the Art of Record*

Claims 1, 4, 6 through 8, and 10 through 32 stands rejected over United States Patent No. 3,383,223 ("US 223") to Rose in view of Wessling et al., Vinylidene Chloride Polymers, Kirk-Othmer Encyclopedia of Chemical Technology, 2002 ("Wessling") and Whistler et al., Kirk-Othmer Encyclopedia of Chemical Technology, 2000 ("Whistler"). Claim 9 stands rejected over the foregoing references and further in view of United States Published Application No. 2002/0064580 (US 580) to Gord et al. Claim 33 stands rejected over US 223 in view of Wessling, Whistler and United States Patent No. 6,545,082 (US 082) to Yasue.

It may be useful to briefly consider the invention before addressing the merits of the rejection.

Applicants respectfully reiterate that cellulosic food casings have long been known in the art. Processes by which to form cellulosic food casings generally involve extruding a solution of either viscose-cellulose or NMMO-cellulose. Unfortunately, the formation of cellulosic food casings is both expensive and environmentally challenging.

Altogether unexpectedly, Applicants have found food casings which can be produced simply, inexpensively, and in an environmentally friendly manner.

Applicants have more particularly determined that casings formed from fibrous web reinforcements that have merely been coated with a film-forming-protein composition can be produced simply and inexpensively. The inventive coatings, present on at least one side of the reinforcement, permeates the reinforcement and fills the interstices therein, as recited in Claim 1 as-amended, providing superior bonding. If the film-forming protein is water-soluble, the coating also incorporates at least one compound to crosslink the protein.

Advantageously, the fibrous support web has a weight per unit area of 3 to 400 g/m<sup>2</sup> and consists of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper, as further recited in Claim 1.

In especially advantageous aspects, the inventive coating consists of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional secondary plasticizer, (iv) optional dye and/or pigments and (v) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25.

In particularly beneficial aspects, the inventive food casings consist of reinforcement and a single coating, in which the coating uniformly coats and permeates the reinforcement, filling interstices therein and the resulting casing has a weight per unit area of 78 to 200 g/m<sup>2</sup> and exhibits a water vapour permeability of 300 to 1500 g/m<sup>2</sup>d, as recited in Claim 27 as-amended.

In especially expedient embodiments the reinforcement has a weight per unit area of 10 to 130 g/m<sup>2</sup> and the dried casing has a weight per unit area of 30 to 200 g/m<sup>2</sup>, resulting in inventive casings exhibiting an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging from about 10 to 100 l/m<sup>2</sup>d at 40 bar, as recited in Claim 31 as-amended.

Applicants respectfully submit that the cited references do not teach or suggest the claimed invention.

US 223 is directed to a cellulose casing having a coating of insolubilized gelatin on the inside which improves adhesion of the casing to an encased food product. (Col. 2, lines 50 – 57), US 223 initially notes that cellulose casings are known to be more sanitary than natural casings, but that they lack the ability to shrink with the sausage during the drying of the sausage emulsion. (Col. 2, lines 20 – 30). The coating of US 223, applied to the inside of the casing, allows the casing to adhere to the sausage emulsion and follow its shrinkage during curing. (Col. 2, lines 35 – 46). The impetus of US 223 is that the addition of a dialdehyde to the gelatin eliminates the

loss of gelatin during sausage presoaking. (Col. 3, lines 5 – 40). The cellulose casing may be regenerated cellulose film or paper reinforced cellulose casing. (Col. 3, lines 25 – 30). The insolubilized gelatin may alternatively be applied to the outside of cellulose casings whose outside surfaces have a saran coating. (Col. 8, lines 14 – 18). The casings of US 223 may alternatively be formed from alginate (a polysaccharide), amylose (a polysaccharide) or polyvinyl alcohol films. (Col. 8, lines 20 – 23).

US 223, primarily directed to cellulose casings, does not teach or suggest the inventive casings in which protein permeates the reinforcement and fills interstices therein, as recited in Claims 1, 25 and 27 as-amended. US 223 instead requires either cellulose, or in the alternative, alginate, amylose or polyvinyl alcohol to impregnate its optional reinforcement. Applicants further respectfully submit that to modify US 223 so to avoid its cellulose, polysaccharide or polyvinyl alcohol casing-matrix material would altogether change its principle of operation.

And US 223 most certainly does not teach or suggest such casings in which the inventive coatings consist of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional secondary plasticizer, (iv) optional dye and/or pigments and (v) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended.

Nor does US 223 teach or suggest that such inventive food casings consisting of reinforcement and a single protein-containing coating, in which the coating uniformly coats the reinforcement and the casing has a weight per unit area of 78 to 200 g/m<sup>2</sup>, would result in a casing exhibiting a water vapour permeability of 300 to 1500 g/m<sup>2</sup>d, as recited in Claim 27.

US 223 similarly fails to teach or suggest that inventive casings formed from a protein-coated reinforcement in which the reinforcement has a weight per unit area of 10 to 130 g/m<sup>2</sup> and the dried casing has a weight per unit area of 30 to 200 g/m<sup>2</sup> would result in casings exhibiting both an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging from about 10 to 100 l/m<sup>2</sup>d, as recited in Claim 31 as-amended.

Accordingly, Applicants respectfully submit that US 223 does not teach or suggest the claimed invention.

Wessling and Whistler do not cure the deficiencies in US 223.

Wessling is merely an encyclopedic reference directed to vinylidene chloride polymers. As correctly noted by the Examiner in the outstanding Office Action at Ref. No. 13, Wessling indicates that saran is a trade name for polyvinylidene chloride. Wessling goes on to describe the formation, structure, properties, decomposition, and applications associated with polyvinylidene chloride.

Regardless of any teachings of saran, Wessling, solely directed to polyvinyl chloride, does not teach or suggest the inventive casings in which protein (a polypeptide) permeates the reinforcement and fills interstices therein, as recited in Claims 1, 25 and 27 as-amended.

Accordingly, Applicants respectfully submit that Wessling does not teach or suggest the claimed invention, considered either alone or in combination with any or all of the remaining art of record.

Whistler is similarly merely an encyclopedic reference directed to starch. As correctly noted by the Examiner in the outstanding Office Action at Ref. No. 11, Whistler indicates that starches contain D-glucopyranose polymers, such as illustrated in its Figure 1 for amylose. Whistler goes on to describe starch manufacture, uses, and derivatives.

Regardless of its teaching of starch as a polysaccharide, Whistler, solely directed to starch, does not teach or suggest the inventive casings in which protein (a polypeptide) permeates the reinforcement and fills interstices therein, as recited in Claims 1, 25 and 27 as-amended.

Accordingly, Applicants respectfully submit that Whistler likewise does not teach or suggest the claimed invention, considered either alone or in combination with any or all of the remaining art of record.

Applicants respectfully submit that there would have been no motivation to have combined US 223, Wessling and Whistler. However, if even Applicants had combined US 223, Wessling and Whistler, (which Applicants did not do) the claimed invention would not have resulted.

The combination simply does not teach or suggest the inventive casings in which protein (i.e. polypeptide) permeates the reinforcement and fills interstices therein, as recited in Claims 1, 25 and 27 as-amended. US 223 instead requires either cellulose, a polysaccharide or polyvinyl alcohol to impregnate its optional reinforcement. Whistler is merely an encyclopedic reference directed to a specific synthetic polysaccharide, i.e. starch. Whistler is merely an encyclopedic reference directed to a specific synthetic polymer, i.e. polyvinylidene chloride.

The combination thus does not teach or suggest such casings in which the inventive coatings consist of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional secondary plasticizer, (iv) optional dye and/or pigments and (v) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended.

Nor does the combination teach or suggest that such inventive food casings consisting of reinforcement and a single protein-containing coating, in which the coating uniformly coats the reinforcement and the casing has a weight per unit area of 78 to 200 g/m<sup>2</sup>, would result in a casing exhibiting a water vapour permeability of 300 to 1500 g/m<sup>2</sup>d, as recited in Claim 27.

The combination similarly fails to teach or suggest that inventive casings formed from a protein-coated reinforcement in which the reinforcement has a weight per unit area of 10 to 130 g/m<sup>2</sup> and the dried casing has a weight per unit area of 30 to 200 g/m<sup>2</sup> would result in casings exhibiting both an extension ranging between 0.1 and 5 % in the longitudinal and transverse

directions and water permeability ranging from about 10 to 100 l/m<sup>2</sup>d, as recited in Claim 31 as amended.

Accordingly, Applicants respectfully submit that US 223, Wessling and Whistler do not teach or suggest the claimed invention, considered either alone or in any combination.

Claim 9 is likewise patentable in further light of US 580.

As the case with the primary reference, US 580 is similarly directed to cellulose-based food casings, particularly cellulose-based food casings obtained in an amine oxide process. [0017]. In the process, a solution of cellulose in a monohydrate of N-methyl-morpholine-N-oxide (NMMO) is prepared, a surface-modifying additive and an internal-structure-changing additive are added to the solution and the mixture is then shaped into a tubular casing. [0013 and 0027]. The surface-modifying additive may be selected from any of a generic list, including paraffin, and is present in amounts as low as 0.2 % by weight. [0014 and 0020] The structure-modifying agent may similarly be selected from any of a generic list, including polyester and fatty acids. [0021] The cellulose-based casings of US 580 include at least 50% by weight of cellulose or cellulose derivatives. [0018]

Applicants respectfully reiterate that US 580, directed to cellulose casings incorporating any of a number of structure-modifying additives, does not teach or suggest the inventive protein-based coatings, as recited in the claimed invention. Nor would there have been any expectation that the structure-modifying additives of US 580, incorporated into NMMO-cellulose compositions, would be compatible with the recited protein-based coatings.

US 223, Wessling and Whistler do not teach or suggest the claimed invention, based upon the reasoning provided above.

There would similarly have been no motivation to have combined US 223, Wessling, Whistler and US 580. However, even if Applicants had combined US 223, Wessling, Whistler and US 580 (which Applicants did not do), the claimed invention would not have resulted.

This combination similarly does not teach or suggest the inventive casings in which protein coating permeates the reinforcement and fills the interstices therein, as recited in Claim 9 as-amended. As noted above, US 223 requires either cellulose, a polysaccharide or polyvinyl alcohol to impregnate its optional reinforcement. US 580 likewise requires cellulose. Whistler is merely an encyclopedic reference directed to a specific synthetic polysaccharide, i.e. starch. Whistler is merely an encyclopedic reference directed to a specific synthetic polymer, i.e. polyvinylidene chloride.

And the combination most certainly does not teach or suggest the inventive casings in which a protein-based coating permeating the reinforcement contains further natural or synthetic polymer selected from a poly-acrylate, polyvinyl acetate and/or a (co)polymer having units of vinyl acetate and/or units of saponified vinyl acetate (vinyl alcohol), as further recited in Claim 9.

US 580 merely provides a generic list of structure-modifying additives, such as polyester, that may be incorporated into a cellulosic composition.

Accordingly, Applicants respectfully submit that the claimed invention is similarly patentable in light of US 223, Wessling, Whistler and US 580, considered either alone or in any combination.

Claim 33 is similarly patentable in further light of US 082.

US 082 is directed to anti-blocking coatings for resin sheets. (Col. 1, lines 5 – 7). The coating includes one or more of water-soluble resin, resin emulsion, solvent resin and resin beads. (Col. 2, lines 28 – 31). Soluble protein may further be included within the coating to improve surface lubricity. (Col. 3, lines 3 – 4). The protein is selected so as to be incompatible with the water/soluble resin/resin emulsion/solvent resin. (Col. 3, lines 19 – 24). Exemplary

proteins include whey and egg white. (Col. 3, lines 5 – 10). Exemplary incompatible resin suitable for combination with such soluble protein is ethylene –acryl copolymer. (Col. 4, lines 31 – 32). The coatings of US 082 may be applied to soft resin sheet or enamel coated fabric. (Col. 3, lines 32 – 35).

US 082, requiring water-soluble resin, resin emulsion, solvent resin and/or resin beads, does not teach or suggest the recited casings incorporating a single coating on fibrous material consisting of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional secondary plasticizer, (iv) optional dye and/or pigments and (v) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 33 as-amended. Applicants further respectfully submit that to omit US 082's required water-soluble resin, resin emulsion, solvent resin and/or resin beads would render it unfit for its intended purpose.

Nor does US 082, applying its coatings to enamel coated fabrics, teach or suggest inventive casings in which the protein coating permeates the fibrous material and fills interstices therein, as further recited in Claim 33 as-amended.

US 223, Wessling and Whistler do not teach or suggest the claimed invention, based upon the reasoning provided above.

There would similarly have been no motivation to have combined US 223, Wessling, Whistler and US 082. However, even if Applicants had combined US 223, Wessling, Whistler and US 082 (which Applicants did not do), the claimed invention would not have resulted.

The combination does not teach or suggest the recited casings incorporating a single coating on a flat fibrous material consisting of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional secondary plasticizer, (iv) optional dye and/or pigments and (v) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 33 as-amended. US 082 requires water-soluble resin, resin emulsion, solvent resin and/or resin beads coated onto a resin sheet or enamel coated fabric. US 223 requires either a cellulose,

polysaccharide or polyvinyl alcohol casing-matrix. Wessling and Whistler do not cure this deficiency.

Nor does the combination teach or suggest inventive casings in which the recited single protein-based coating permeates the fibrous material and fills interstices therein, as further recited in Claim 33 as-amended. Applicants respectfully reiterate that the primary reference is directed to cellulose, polysaccharide or polyvinyl alcohol casing-matrix. US 082 teaches enamel coated fabrics. Wessling and Whistler do not cure this deficiency.

Accordingly, Applicants respectfully submit that Claim 33 is similarly patentable in light of US 223, Wessling, Whistler and US 082, considered either alone or in any combination.

### CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1, 4 and 6 through 34 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

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Respectfully submitted,

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